

REMARKS

Claim 1 has been rejected under 35 U.S.C. §102(e) as anticipated by Nagashima et al (U.S. Patent No. 5,994,790), while Claims 2-5 and 7-9 have been rejected under 35 U.S.C. §103(a) as unpatentable over Nagashima et al and Claims 6 and 11 have been rejected as unpatentable over Nagashima et al in view of Yoshida et al (U.S. Patent No. 6,157,091). In addition, in view of the disposition of the claims indicated on the Office Action Summary (Claims 1-25 having been rejected) and in view of the Office Action at page 5, it appears that Claims 12-25 have been rejected. However, neither the statutory basis nor the references applied against Claims 12-25 have been indicated. For the reasons set forth hereinafter, Applicant respectfully submits that Claims 1-25 are distinguishable over the references cited of record, whether considered separately or in combination.

First, with regard to Claims 12-25, the Office Action states that the arrangement of elements and the placement of fuses in a vehicle electric system is not considered to contain a novel step in the design of a system. However, it is unclear based on this statement exactly what basis is being asserted for the rejection of Claims 12-25, which recite various configurations of a power supply apparatus for a vehicle in which separate supply circuits are provided for

various vehicle components, together with apparatus for controlling the supply power to the several circuits. Since no particular combination of references has been cited, nor is any specific basis set forth for the rejection of Claims 12-25 (which differ considerably in their scope and content) Applicant is regretfully unable to formulate a proper response. Accordingly, clarification of this ground of rejection is requested, together with the issuance of a non-final Office Action with respect to Claims 12-25.

The Nagashima et al reference discloses a method for detecting an abnormal electric current passing through a wire connecting a load to a power source in a vehicle. The particular method steps involved are recited, for example in the Abstract, and involve detecting the electric current values; counting the number of times that the sampled electric current exceeds a predetermined value during a preset time interval; and determining the occurrence of an abnormal electric current when the number of such count exceeds a preset number of times. In addition, provision is also made for counting the number of such events during a next sequential period, and determining the passage of an abnormal electric current when the number of counts is larger than a second preset number of times.

The Office Action indicates at paragraph 3 that Nagashima et al discloses an electric power line (200) comprising a plurality of segments wired in an interior of a vehicle. To this extent, Nagashima et al includes some structure which is similar to that of the present invention.

Nevertheless, it is apparent from the foregoing description that the Nagashima et al apparatus differs fundamentally from the present invention, which is directed to a power supply arrangement in a motor vehicle in which a single battery or power source is used to supply electric power to multiple loads within a vehicle via a plurality of power supply circuits, which can be adjusted by means of control units in order to accommodate and compensate for the occurrence of a short in one of the power supply circuits.

Claim 1, for example, recites an electric power line which comprises a plurality of sequentially connected segments for supplying power to various kinds of loads on the vehicle, as well as a plurality of short sensors for detecting the occurrence of a short circuit in at least one of the segments. Finally, a control circuit is provided for indicating a short circuited segment of the electric power line based on signals from the short circuit sensors, together with means responsive to signals from the control circuit for removing the short

circuited segment from the electric power line for supplying power to the loads. These features of the invention are neither taught nor suggested by Nagashima et al.

Claim 3, on the other hand, recites a power supply apparatus for a vehicle including a battery, as well as a load drive electric power line for driving a vehicle load and a control circuit drive electric power line for driving a control apparatus. The control apparatus includes a control circuit which is supplied with power from the control circuit drive electric power line, while the load drive circuit is connected between the load drive electric power line and the load for controlling the supply of power to the load, in response to a signal from the control unit. The latter features are also neither taught nor suggested by Nagashima et al.

Similarly, Claim 7 recites a power supply apparatus which includes, in addition to a battery, a first power supply circuit for supplying power from the battery to a plurality of loads, and a second power supply circuit for applying power from the battery to a control circuit of a control apparatus for controlling at least one load of the vehicle. Finally, a protection circuit is provided for detecting a short circuit, and for implementing a protection control of the first power supply circuit through the control circuit. The Nagashima et

al reference also contains no disclosure of such a protection circuit for controlling the respective supply circuits to both the vehicle load and to the control unit, via the control circuit.

Independent Claim 8, on the other hand, recites a power supply apparatus in which first, second and third power supply systems are provided for supplying power to respective loads of the vehicle via separate circuits. In particular, a first power supply system supplies power to a running control load, while a second power supply system supplies power to an equipment system load. The third power supply system supplies power to a "control circuit for controlling said equipment system load." The Nagashima et al reference fails to teach or disclose any such configuration of a power supply system, or for supplying power to a control circuit which controls the supply of power to one of two groups of loads through other power supply systems provided in the vehicle.

Claim 9, on the other hand, recites a power supply control apparatus for a vehicle. The control apparatus includes not only a vehicle mounted power supply which supplies power to a vehicle load through a driver circuit, but also a fuse. A shutdown circuit is provided between the driver circuit and the fuse, as well as a control circuit for providing a shutdown to the shutdown circuit. The Nagashima

et al reference, on the other hand, as noted previously, is directed to the task of detecting abnormal electric currents, and contains no apparatus for altering the supply circuit for the vehicle in the manner recited.

Claim 10 recites a power supply apparatus for a vehicle which includes a vehicle mounted power supply and a plurality of control modules, each having a control circuit in which a load drive signal is generated and a load drive circuit for controlling a power supply to a load according to a drive signal from the control circuit. A first relatively larger power line is provided for supplying drive power from the vehicle mounted power supply via at least two of the control modules. On the other hand, a second relatively smaller power line is provided for supplying control circuit power from the vehicle mounted power supply through a second fuse via control circuits of the respective control modules. Once again, as noted previously, the Nagashima et al reference contains no such apparatus including control modules for controlling the supply of power to vehicle components via a first relatively larger power line and a second relatively smaller power line, as recited.

Finally, Claim 11 recites a load control system having a control module for a power supply apparatus of the vehicle. The control module comprises a communication circuit which is

connectable to another module through a communication line. In addition, a control circuit outputs a load control signal in accordance with the signal which is inputted through the communication circuit. A drive circuit controls power supplied to the load in accordance with an output signal from the control circuit, while a relay opens and closes a power line to a particular load as a function of an output from the control circuit. Finally, a fuse is connected between the battery and a specific load for protecting against overcurrents. The Nagashima reference neither teaches nor suggests a provision of a relay for opening and closing a power line to a particular load as a function of an output from a control circuit, which in turn is driven by a signal inputted through a communication circuit connected between respective modules.

The latter omission is said to be remedied by Yoshida et al which discloses a communication system in which electric power to electric loads are controlled by multiplex communication system. However, the Office Action contains no suggestion as to how the complex structure of the Yoshida et al reference would or could be combined with Nagashima et al in order to yield the invention recited in Claim 11. Nor is it apparent that such a combination would yield the specific control system of Claim 11 in any event.

Accordingly, Applicant respectfully submits that Claims 1-11 distinguish over the Nagashima et al and Yoshida et al references, either considered separately or in combination. To the extent that the rejection of Claims 12-25 is understood, and to the extent necessary for a complete response, Applicant respectfully traverses the rejection of Claims 12-25.

In light of the foregoing remarks, this application should be in condition for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

It is respectfully requested that, if necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or

credit any overpayments to Deposit Account No. 05-1323 (Docket #381NP/47981).

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Gary R. Edwards".

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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO THE CLAIMS

1. (Twice Amended) A power supply apparatus for a vehicle, comprising:

an electric power line comprising a plurality of sequentially connected segments wired in an interior of a vehicle from a battery, for supplying power to various kinds of loads of said vehicle;

a plurality of short sensors for detecting a short circuit in at least one of said plurality of segments of said electric power lines; [and]

a control circuit for specifying a short circuited segment of said electric power line in accordance with a short detection condition of said plurality of short sensors; and

means responsive to signals from said control circuit for removing the short circuited segment from said electric power line for supplying power to said loads.

3. (Twice Amended) A power supply apparatus for a vehicle, comprising:

a battery;

a load drive electric power line wired in an interior of a vehicle from the battery through a first fuse, for driving a vehicle load;

a control circuit drive electric power line wired in said interior of said vehicle from a battery through a second fuse, for driving a control apparatus; [and]

at least one control apparatus including [:] a control circuit which is supplied with power from said control circuit drive electric power line; and

a load drive circuit provided between said load drive electric power line and said load, for controlling a supply of [a] power to said load in response to a signal from said control circuit.

7. (Twice Amended) A power supply apparatus for a vehicle, comprising:

a battery;

a first power supply circuit wired in an interior of a vehicle through a first fuse from the battery, for supplying power to a plurality of loads of said vehicle;

a second power supply circuit wired in said interior of said vehicle through a second fuse from the battery, for

supplying power to a control circuit of a control apparatus for controlling [said] at least one load of said vehicle; and

a protection circuit for detecting a short circuit of said first power supply circuit and for implementing a protection control of said first power supply circuit through said control circuit.

8. (Twice Amended) A power supply apparatus for a vehicle, comprising:

a battery;

a first power supply system wired in an interior of a vehicle through a first circuit including a first fuse from the battery, for supplying power to a running control load of said vehicle;

a second power supply system wired in said interior of said vehicle through a second circuit including a second fuse from said battery, for supplying power to an equipment system load of said vehicle; and

a third power supply system wired in said interior of said vehicle through a third circuit including a third fuse from said battery, for supplying power to a control circuit for controlling said equipment system load.